Neurobiology

Volume Contents

Vol. 33, No. 1, July 1997

Synergistic Effects of Testosterone Metabolites on the Development of Motoneuron Morphology in a Sexually Dimorphic Rat Spinal Nucleus / 1 K. A. Burke, M. R. Widows, and D. R. Sengelaub

New Electrical Properties of Neurons Induced by a Homeoprotein / 11 Gabriel O. Aisemberg, Timothy R. Gershon, and Eduardo R. Macagno

Analysis of Spontaneous Electrical Activity in Cerebellar Purkinje Cells Acutely Isolated from Postnatal Rats / 18 Sang C. Nam and Philip E. Hockberger

Neuronal cAMP-Dependent Protein Kinase Type II Is Concentrated in Mushroom Bodies of *Drosophila melanogaster* and the Honeybee Apis mellifera / 33 Uli Müller

Vasotocinergic Innervation of Areas Containing Aromatase-Immunoreactive Cells in the Quail Forebrain / 45

Jacques Balthazart, Philippe Absil, Carla Viglietti-Panzica,
and Gian Carlo Panzica

Sexually Dimorphic Neuron Addition to an Avian Song-Control Region Is Not Accounted for by Sex Differences in Cell Death / 61
M. J. Burek, K. W. Nordeen, and E. J. Nordeen

Is Laminin-1 a Guidance Cue for Cerebellar Granule Cell Migration? / 72
Barbara Lom and Philip E. Hockberger

Differential Effects of Depolarization on the Growth of Crayfish Tonic and Phasic Motor Axons in Culture / 85

Kathleen F. Arcaro and Gregory A. Lnenicka

Cover: Photomicrograph of a dye-filled AP neuron in the central nervous system of the medicinal leech. When this cell is injected with mRNA of the Hox/HOM gene Lox1 and expresses the corresponding homeodomain-containing transcription factor, its electrical properties are specifically modified. See the article by Aisemberg et al., pp. 11-17, this issue. (Photo courtesy of Dr. L. Wolszon.)

Vol. 33, No. 2, August 1997

Neuronal Responses to Turtle Head Rotation In Vitro / 99 Tian Xing Fan, Charles Scudder, and Michael Ariel The $\alpha 1$ Subunit of Laminin-1 Promotes the Development of Neurons by Interacting with LBP110 Expressed by Neural Crest-Derived Cells Immunoselected from the Fetal Mouse Gut / 118

Alcmène Chalazonitis, Virginia M. Tennyson, Maura C. Kibbey, Taube P. Rothman, and Michael D. Gershon

Proctolin's Role in Neurally Evoked Contractions of the Locust Oviducts / 139 K. F. Noronha and A. B. Lange

A Nuclear Localization Signal Targets Proteins to the Retrograde Transport System, Thereby Evading Uptake into Organelles in Aplysia Axons / 151
Robert Schmied and Richard T. Ambron

Concentration-Dependent Stimulation and Inhibition of Growth Cone Behavior and Neurite Elongation by Protein Kinase Inhibitors KT5926 and K-252a / 161

Joel V. Oberstar, Jean F. Challacombe, Florence K. Roche, and Paul C. Letourneau

Adenoviral Vector-Directed Expression of Neurotrophin-3 in Rat Dorsal Root Ganglion Explants Results in a Robust Neurite Outgrowth Response / 172 Paul A. Dijkhuizen, Wim T. J. M. C. Hermens, Marc A. T. Teunis, and Joost Verhaagen

Mass and Functional Capacity of Regenerating Muscle Is Enhanced by Myoblast Transfer / 185

Maria E. Arcila, Bill T. Ameredes, John F. DeRosimo, Charles H. Washabaugh, Jiwei Yang, Peter C. Johnson, and Marcia Ontell

Mutation of the Central Nervous System Neuroblast Proliferation Repressor ana Leads to Defects in Larval Olfactory Behavior / 199
Youngji Park, M. Craig Caldwell, and Sumana Datta

Cover: Growth cones at the branched tip of a sensory neuronal axon labeled to show actin filaments (red) and microtubules (green). Increased protrusion of filopodia and lamellipodia at this axon tip was induced with 2 μ m K252-a, a protein kinase inhibitor. See Oberstar et al., pages 161–171, this issue.

Vol. 33, No. 3, September 1997

Laryngeal Motor Control in Frogs: Role of Vagal and Laryngeal Feedback / 213
Naoki Kogo, Steven F. Perry, and John E. Remmers

Photoperiod Regulation of Neuron Death in the Adult Canary / 223 John R. Kirn and Hubert Schwabl

Kainic Acid-Induced Excitotoxicity Is Associated with a Complex c-Fos and c-Jun Response Which Does Not Preclude Either Cell Death or Survival / 232 Esther Pozas, Jordi Ballabriga, Anna M. Planas, and Isidro Ferrer

 $Localization, \ Physiology, \ and \ Modulation \ of \ a \ Molluskan \ Dopaminergic \\ Synapse \ / \ 247$

Neil S. Magoski and Andrew G. M. Bulloch

Modulation of the Dihydropyridine-Sensitive Calcium Channels in *Drosophila* by a Phospholipase C-Mediated Pathway / 265

Gang-Guo Gu and Satpal Singh

Supraspinal Influence on the Development of Motor Behavior in the Fetal Lamb $/\ 276$

Philip J. Berger, Mary A. Kyriakides, and Ian R. C. Cooke

In Vivo Neurogenesis Is Inhibited by Neutralizing Antibodies to Basic Fibroblast Growth Factor / 289

Y. Tao. I. B. Black, and E. DiCicco-Bloom

Peptidergic Activation of Locust Dorsal Unpaired Median Neurons: Depolarization Induced by Locustatachykinins May Be Mediated by Cyclic AMP / 297

C. Tomas Lundquist and Dick R. Nässel

A Novel Action of Collapsin: Collapsin-1 Increases Antero- and Retrograde Axoplasmic Transport Independently of Growth Cone Collapse / 316 Yoshio Goshima, Tadashi Kawakami, Hideaki Hori, Yoshinobu Sugiyama, Shuichi Takasawa, Yoko Hashimoto, Masako Kagoshima-Maezono, Toshifumi Takenaka, Yoshimi Misu, and Stephen M. Strittmatter

Protection against Developmental Retardation in Apolipoprotein E-Deficient Mice by a Fatty Neuropeptide: Implications for Early Treatment of Alzheimer's Disease / 329

Illana Gozes, Michal Bachar, Amos Bardea, Ariane Davidson, Sarah Rubinraut, Mati Fridkin, and Eli Giladi

Cover: Dual labelling of pre- and postsynaptic axons in the nervous system of the mollusc, *Lymnaea stagnalis*. The presynaptic neuron was stained with Lucifer Yellow (yellow-green axons) and the postsynaptic neuron was stained with sulforhodamine (red axons). Note the varicosities on the axon collaterals, which are likely presynaptic terminals. See Magoski and Bulloch, pages 247–264, this issue.

Vol. 33, No. 4, October 1997

Adult Bengalese Finches (Lonchura striata var. domestica) Require Real-Time Auditory Feedback to Produce Normal Song Syntax / 343 Kazuo Okanoya and Ayako Yamaguchi

Serotonin Depletion by 5,7-Dihydroxytryptamine Alters Deutocerebral Development in the Lobster, *Homarus americanus / 357 J. Benton, R. Huber, M. Ruchhoeft, S. Helluy, and B. Beltz*

Mitral/Tufted Cell Activity Is Attenuated and Becomes Uncoupled from Respiration following Naris Closure / 374

B. D. Philpot, T. C. Foster, and P. C. Brunjes

Protein Kinase C and Receptor Kinase Gene Expression in Olfactory Receptor Neurons / 387

Richard C. Bruch, Jiesheng Kang, Michael L. Moore, Jr., and Kathryn F. Medler

Effects of the Neurotrophins Nerve Growth Factor, Neurotrophin-3, and Brain-Derived Neurotrophic Factor (BDNF) on Neurite Growth from Adult Sensory Neurons in Compartmented Cultures / 395

K. Kimpinski, R. B. Campenot, and K. Mearow

FGF2 Suppresses Neuronogenesis of a Cell Line Derived from Rat Olfactory Epithelium $/\ 411$

Bradley J. Goldstein, Benjamin L. Wolozin, and James E. Schwob

Effects of Unilateral Olfactory Deprivation in the Developing Opossum, Monodelphis domestica / 429 $\,$

D. M. Cummings, B. R. Knab, and P. C. Brunjes

Regeneration of Cercal Filiform Hair Sensory Neurons in the First-Instar Cockroach Restores Escape Behavior / 439

Michael Stern, Vernita L. Ediger, Charles R. Gibbon, Jonathan M. Blagburn, and Jonathan P. Bacon

Radial Glial Cell Development and Transformation Are Disturbed in reeler Forebrain / 459

Kim E. Hunter-Schaedle

Multiple Subcellular mRNA Distribution Patterns in Neurons: A Nonisotopic In Situ Hybridization Analysis / 473

Michele A. Paradies and Oswald Steward

Cover: The NIC cell line, which is derived from neonatal rat olfactory epithelium, expresses the sustentacular cell-specific marker cytokeratin 18 (red label in the photomicrograph; the nuclei have been stained blue by Hoechst dye). Nonetheless, NIC cells resemble the multipotent progenitors activated *in vivo* by direct damage to the epithelium: they express the a globose basal cell-neuronal cell surface antigens recognized by the monoclonal antibodies GBC-1 and GBC-2, in addition to expressing proteins that are typical of sustentacular and horizontal basal cells. They can be pushed to differentiate toward becoming neurons, however exogenous FGF2 completely blocks the neuronal differentiation induced by serum withdrawal. See Goldstein et al., pages 411–428, this issue.

Vol. 33, No. 5, November 5, 1997

Special Issue THE NEUROBIOLOGY OF BIRDSONG

An Introduction to Birdsong and the Avian Song System / 495 Eliot A. Brenowitz, Daniel Margoliash, and Kathy W. Nordeen

Three Models of Song Learning: Evidence from Behavior / 501 Peter Marler

Comparative Approaches to the Avian Song System / 517 Eliot A. Brenowitz

Anatomical and Synaptic Substrates for Avian Song Learning / 532 Kathy W. Nordeen and Ernest J. Nordeen

Role of Gene Regulation in Song Circuit Development and Song Learning / 549 David F. Clayton

Sexual Differentiation of the Zebra Finch Song System: Positive Evidence, Negative Evidence, Null Hypotheses, and a Paradigm Shift / 572

Arthur P. Arnold

Birth, Migration, Incorporation, and Death of Vocal Control Neurons in Adult Songbirds / 585

Arturo Alvarez-Buylla and John R. Kirn

Circuits, Hormones, and Learning: Vocal Behavior in Songbirds / 602 Sarah W. Bottjer and Frank Johnson

Sex Steroids and Their Actions on the Birdsong System / 619 $Barney\ A.\ Schlinger$

Peripheral Control and Lateralization of Birdsong / 632 Roderick A. Suthers

Neural Pathways for the Control of Birdsong Production / 653 J. Martin Wild

Functional Organization of Forebrain Pathways for Song Production and Perception / 671

Daniel Margoliash

Song- and Order-Selective Neurons Develop in the Songbird Anterior Forebrain during Vocal Learning / 694

Allison J. Doupe and Michele M. Solis

Cover: Photograph of an adult male song sparrow (*Melospiza melodia*) in the act of producing song, a learned behavior. Inset shows HVc neurons that project to an anterior forebrain circuit necessary for song learning. Photographs courtesy of John Burt (sparrow) and Farida Sohrabji (Dil-labeled neurons).

Vol. 33, No. 6, November 20, 1997

Mutant Molecular Motors Disrupt Neural Circuits in Drosophila / 711 S. Reddy, P. Jin, J. Trimarchi, P. Caruccio, R. Phillis, and R. K. Murphey

Macrophage Activity in Organ Cultures of the Avian Cochlea: Demonstration of a Resident Population and Recruitment to Sites of Hair Cell Lesions / 724 Mark E. Warchol

Activity-Dependent Regulation of N-cadherin in DRG Neurons: Differential Regulation of N-cadherin, NCAM, and L1 by Distinct Patterns of Action Potentials / 735

Kouichi Itoh, Miwako Ozaki, Beth Stevens, and R. Douglas Fields

Expression of $\emph{c-ret}$ in the Zebrafish Embryo: Potential Roles in Motoneuronal Development / 749

Brent W. Bisgrove, David W. Raible, Virginia Walter, Judith S. Eisen, and David J. Grunwald

Gicerin, a Cell Adhesion Molecule, Participates in the Histogenesis of Retina / 769 Yasuhiro Tsukamoto, Eiichi Taira, Jyoji Yamate, Yoshifumi Nakane, Kenji Kajimura, Masaoki Tsudzuki, Yasuo Kiso, Takao Kotani, Naomasa Miki, and Sadashige Sakuma

Expression of the Na-K-2Cl Cotransporter Is Developmentally Regulated in Postnatal Rat Brains: A Possible Mechanism Underlying GABA's Excitatory Role in Immature Brain / 781

M. D. Plotkin, E. Y. Snyder, S. C. Hebert, and E. Delpire

Calcium/Calmodulin-Dependent Protein Kinase II Expression in Motor Neurons: Effect of Axotomy / 796
Linda M. Lund and Irvine G. McOuarrie

Xefiltin, a $Xenopus\ laevis$ Neuronal Intermediate Filament Protein, Is Expressed in Actively Growing Optic Axons during Development and Regeneration / 811

Yangu Zhao and Ben G. Szaro

F. Bonhoeffer, and S. B. Kater

Retinal Axon Growth Cone Responses to Different Environmental Cues Are Mediated by Different Second-Messenger Systems / 825

J. Löschinger, C. E. Bandtlow, J. Jung, S. Klostermann, M. E. Schwab,

Glial-Derived Neurotrophic Factor Rescues Calbindin-D_{28k}-Immunoreactive Neurons in Alcohol-Treated Cerebellar Explant Cultures / 835
Robert E. McAlhany, Jr., James R. West, and Rajesh C. Miranda

Astrocytes Regulate Amino Acid Receptor Current Densities in Embryonic Rat Hippocampal Neurons / 848

Qi-Ying Liu, Anne E. Schaffner, Yoong Hee Chang, Kristine Vaszil, and Jeffery L. Barker

Cover: *In situ* hybridization detects the expression of mRNA encoding the Ret receptor tyrosine kinase in the developing eye of a 3-day-old zebrafish. *c-ret* is expressed in the amacrine and horizontal cells of the neuroretina. The gene is also expressed during the differentiation of a number of other neuronal cell types in the early embryo. See Bisgrove et al., pp. 749–768, this issue.

Vol. 33, No. 7, December 1997

Localization of Androgen Receptor mRNA-Containing Cells in Avian Respiratory-vocal Nuclei: An *In Situ* Hybridization Study / 865 M. Gahr and J. M. Wild

Identification of a Phylogenetically Conserved Sug1 CAD Family Member that is Differentially Expressed in the Mouse Nervous System / 877

Danhui Sun, Jonathan C. Swaffield, Stephen Albert Johnston,

Carolanne E. Milligan, R. Thomas Zoeller, and Lawrence M. Schwartz

Sensorimotor Pathways Involved in Interjoint Reflex Action of an Insect Leg / 891 Dietmar Hess and Ansgar Büschges

Expression and Regulation of $\alpha 1\beta 1$ Integrin in Schwann Cells / 914 Helen J. S. Stewart, David Turner, Kristjan R. Jessen, and Rhona Mirsky

Temporal Regulation of Growth Cone Lamellar Protrusion and the Influence of Target Tissue / 929

Gianluca Gallo and Emanuel D. Pollack

Delaminating Myelin Membranes Help Seal the Cut Ends of Severed Earthworm Giant Axons / 945

Martis L. Ballinger, Adam R. Blanchette, Todd L. Krause, Mark E. Smyers, Harvey M. Fishman, and George D. Bittner

 17β -estradiol Attenuates CREB Decline in the Rat Hippocampus following Seizure / 961

Kiran S. Panickar, Guangwei Guan, Michael A. King, Gopal Rajakumar, and James W. Simpkins

Differences in the Fate of Neuronal Acetylcholine Receptor Protein Expressed in Neurons and Stably Transfected Cells \prime 968

Paul D. Kassner and Darwin K. Berg

New Observations on the Development of the Gonadotropin-Releasing Hormone System in the Mouse / 983

T. J. Wu, M. J. Gibson, M. C. Rogers, and A. J. Silverman

Agrin and Acetylcholine Receptors Are Removed from Abandoned Synaptic Sites at Reinnervated Frog Neuromuscular Junctions / 999

Anne M. Stanco and Michael J. Werle

Expression of Neurotrophins and Trk Receptors in the Developing, Adult, and Regenerating Avian Cochlea $\,/\,$ 1019

Ulla Pirvola, Finn Hallböök, Liang Xing-Qun, Jussi Virkkala, Mart Saarma, and Jukka Ylikoski

Author Index to Volume 33 / 1037

Subject Index to Volume 33 / 1041

Volume Contents / I

Cover: Pseudo color image of a reinnervated frog neuromuscular junction stained with anti-agrin antibodies and viewed with confocal microscopy. Agrin is removed from abandoned synaptic sites during reinnervation. From Stanco and Werle, pages 999–1018, this issue.